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Murray L. Weidenbaum

Washington University in St Louis

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Weidenbaum Center on the Economy, Government, and Public Policy — Washington University in St. Louis
Campus Box 1027, St. Louis, MO 63130.

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by

Murray Weidenbaum

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Contact: Melinda Warren
Assistant Director
(314) 889-5630



WASHINGTON UNIVERSITY CAMPUS BOX 1208 ONE BROOKINGS DRIVE ST. LOUIS, MISSOURI 63130-4899

**CENTER FOR THE STUDY
OF AMERICAN BUSINESS**

THE FUTURE OF THE U.S. DEFENSE INDUSTRY

by Murray Weidenbaum

Introduction

The U.S. defense industry is at a fork in the road. The prospect of substantial declines in defense spending has forced a basic rethinking of long-term prospects. Does the industry take the path that leads to conversion into civilian production — and thus obtain a civilian pay-off on the massive national investment in defense technology — or does it take the tough-minded business approach of cutting back and slimming down from its current peak?

The conversion approach has a great deal of appeal. It claims the benefit of keeping in place the jobs of defense workers who otherwise might face extended unemployment. The cut-back alternative, in contrast, smacks of austerity. It is designed to maintain the financial health of the firms as they reduce excess capacity of labor and facilities and adjust to a diminished set of market opportunities. The purpose of this paper is to provide some guidance in the defense industry's selection between these two polar alternatives.

Variation in Conversion Experiences

Historical perspective is useful. Since the end of World War II, the major defense contractors have been trying to use their special talents in other areas of the economy. They have been extremely successful in converting — or to use the preferred business term, diversifying — into several large but closely related markets.

For example, the expansion from aircraft to missiles and space vehicles was a natural and noteworthy progression. Because it happened without much economic disruption, few appreciate the tremendous transformation of the airframe manufacturers into aerospace

Murray Weidenbaum is Mallinckrodt Distinguished University Professor and Director of the Center for the Study of American Business at Washington University in St. Louis. This paper was presented at the annual meeting of the Western Economic Association in Seattle, Washington, July 1, 1991. It draws on the author's forthcoming book, *Small Wars, Big Defense* (Oxford University Press, Fall 1991).

designers and producers. Several large aerospace companies also have developed and manufactured substantial numbers of civilian passenger aircraft but, except for Boeing, profitability has been elusive.

However, the far more numerous attempts on the part of the larger, specialized defense contractors to penetrate civilian non-aerospace markets have not met with similar success, and that is a kind understatement. The failed attempts literally range from canoes to computers to coffins.¹

Most of the diversification ventures outside of the defense and aerospace markets have been abandoned or sold off. The remainder generally operate at marginal levels. These negative experiences have been so frequent — and many of them have so drained the companies — that they now constitute a major obstacle to further diversification efforts into commercial markets.

A recent survey of defense firms by the Center for Strategic and International Studies confirms these negative findings. A majority of the companies reported that they believe a re-orientation to civilian production is "neither feasible nor desirable." Most of the remainder are focusing on non-military opportunities in government.²

Curtiss-Wright provides the most extreme example of the shortcomings of the naive diversification approach. This pioneering aviation firm — which built more aircraft during World War II than any other U.S. company — acted on the assumption that the military market would never recover from its post-World War II lows. It diversified with a vengeance into a host of miscellaneous industrial product areas. Curtiss-Wright never recovered to its previous highs. While its former competitors now enjoy annual sales of aircraft, missiles, and space vehicles in billions, the company's total revenues from its assortment of parts and components totaled a modest \$200 million a year.

Why Did Diversification Go Sour?

A common set of themes arises from studying the diversification experiences of military contractors. The major defense companies are specialized business organizations. They are very good at what they are set up to do — design and produce state-of-the-art weapons. But in order to do their jobs well, they must differ from typical commercial companies in terms of technology, organizational structure, marketing, and financing.

Compared with commercially oriented companies, U.S. defense firms have low capitalization, little commercial marketing capability, and limited experience in producing at high volume and low unit cost. Moreover, their entire administrative structure is geared to the unique reporting and control requirements of the governmental customer. Those defense firms that do operate in civilian markets usually maintain operationally separated, insulated divisions that have little contact with each other, merely reporting to the same top management.³

In a study for the President's Economic Adjustment Committee, the Battelle Memorial Institute stated that, in order to be cost-effective, defense plants have been designed with a single product or production process in mind. "Therefore, by their very nature, [these] production facilities do not easily lend themselves to reuse."⁴

In the CSIS survey cited earlier, 71 percent of the defense firms stated that the Pentagon's procurement policies make it difficult for defense firms to enter or flourish in civilian markets. Bolstering their data with in-depth interviews, the researchers concluded that the Department of Defense (DOD) acquisition system is a major obstacle to civilian diversification, and that military production has evolved into a business culture distinct and closed off from the normal commercial culture.

The response of one defense industry representative was typical: "With this high overhead, together with the facilities, manpower, and systems oriented toward [defense] work, it is extremely difficult to find civilian markets where we can be cost-competitive."⁵ The lack of commercial marketing experience is another familiar refrain in defense industry circles.

Grumman developed and tried to sell a mini-van years before Chrysler popularized it. The project failed because of the lack of a distribution system.

It is not hard to understand why defense company managements have become so reluctant to move from fields they have mastered into lines of business alien to them. Their lack of knowledge of nondefense industries is pervasive. It includes ignorance of products, production methods, advertising and distribution, financial arrangements, contracting forms, and the very nature of the private customer's demands.

Clearly, the type of company that can successfully design and build a new multibillion dollar ICBM network or space exploration system has a very different capability from that of the soap, steel, toy, or other typical cost-conscious but low-technology company operating in the commercial economy.

This point was underscored recently when the chief executive of Martin-Marietta, a large and relatively successful defense contractor, was asked by the Soviets how to convert a tank-producing facility into a refrigerator factory. His response was to tear down the tank plant and build a new refrigerator factory.⁶

The Future of the Military Market

The bottom is not about to fall out of the military market, but a period of severe belt tightening has arrived. The most likely outcome is a substantial decline in the overall volume of defense business for the early 1990s, but with defense spending remaining high by historical standards. Such fluctuations in business opportunities are not unique to defense companies.

Other sectors of the economy regularly adjust to market shifts as part of the normal workings of a private-enterprise system. The U.S. military market, similarly, has been cyclical in nature. However, it has a very different cyclical pattern from the overall business cycle. U.S. defense spending over the past half century has followed a stop-and-go (or rather go-and-stop) cycle.

Historical Perspective

Since the beginning of World War II, the military budget has never experienced an extended period of stability. Eras of rapid growth have alternated with times of austerity.

Often the change in the size and direction of military spending has mirrored the shift in the national security environment facing the United States. This was the case after the Vietnam War when the end of hostilities permitted a substantial reduction in military spending. At other times, the shifting internal response to a relatively constant set of external factors has been more subjective. Witness the rapid buildup in the early 1980s and the abrupt decline starting in the middle of the decade. That sudden change occurred during a period when the threat to U.S. national security remained relatively constant.

The Current Outlook

What about the future? Let us examine three alternatives. An optimistic scenario of minimum change is to assume that, following the end of the Persian Gulf conflict, the modest previous downtrend in the military budget will resume. As in the late 1980s, the military budget, over the five-year period 1991-1995, will rise in nominal terms, but not rapidly enough to offset the effects of inflation. Defense spending would decline at a rate of 2 percent a year, after allowing for inflation. Over the coming five-year period, this policy would generate a reduction of approximately \$80 billion compared to a stable level of defense outlays.⁷

A second — and perhaps more realistic — scenario is to assume that Congress will refrain from voting any increase in the military budget at all, even in nominal terms. If the United States continues to experience an average inflation rate of about 4 percent a year, this would mean an annual decline at the 4 percent rate, after inflation. Over the 1991-1995 time period, this approach would generate a reduction of \$158 billion in defense outlays compared to a stable level (see Table 1).

Prior to the invasion of Kuwait, some military experts offered a third and more pessimistic scenario — cuts in the defense budget by as much as one-half over the coming five years.⁸ In light of more recent developments, however, reductions of this magnitude might

Table 1

**Savings from Alternative Defense Paths
Compared with the CBO Baseline
(fiscal years, in billions)**

Category of Spending	1991	1992	1993	1994	1995	Total 1991-95
2 PERCENT ANNUAL REAL DECLINE IN BUDGET AUTHORITY						
Change in Defense Spending	\$-4	\$-9	\$-15	\$-22	\$-30	\$-80
Change in Interest Spending	*	-1	-2	-3	-5	-11
Total Change in Deficit	\$-4	\$-10	\$-17	\$-25	\$-35	\$-91
4 PERCENT ANNUAL REAL DECLINE IN BUDGET AUTHORITY						
Change in Defense Spending	\$-8	\$-18	\$-30	\$-44	\$-58	\$-158
Change in Interest Spending	*	-1	-3	-6	-10	-20
Total Change in Deficit	\$-8	\$-19	\$-33	\$-50	\$-68	\$-178

* = Less than \$500 million.

Source: Compiled from Congressional Budget Office data.

well be accompanied by some offsetting increases in weapon systems geared to confrontations such as the recent one with Iraq.

Under all three scenarios, a steady erosion would occur in the size of the domestic market available to U.S. defense contractors. What will be the impacts on these firms and how are they likely to respond?

The Defense Company Responses

The Major Defense Prime Contractors

There is great variety among the major defense contractors and in their dependence on the military market; consequently, they react in different ways to major changes in military spending (see Table 2). Let us focus initially on the large aerospace companies — such as General Dynamics, Grumman, Lockheed, Martin-Marietta, McDonnell Douglas, and Northrop — that rely on the Department of Defense for most of their income.

Some, notably General Dynamics, are widely diversified within the military market, producing aircraft, missiles, tanks, and submarines. Others like Martin-Marietta have gained fairly secure niches within that market. A company such as Lockheed has an advantage because it recently won a major weapon-system competition — for the advanced tactical fighter, in this case. Still others, such as McDonnell Douglas, have diversified to a significant degree into commercial aircraft work (but without attaining profitability).

Companies like Grumman and Northrop, which are dependent on just a few weapon-system contracts, are likely to be in for a difficult time, depending on the future of those specific military products. They surely are more vulnerable than the more diversified defense contractors and are responding accordingly. Northrop reduced its research and development effort 46 percent in real terms between 1985 and 1989. Grumman's company-initiated R&D, after adjustment for inflation, slipped by 78 percent during that period. Servicing their high debt load limits the ability of these companies to invest in new undertakings, be they civilian diversification efforts or projects involving defense business.

Because of the military's great dependence on the major defense prime contractors for designing and building key weapon systems and subsystems, their survival as a group seems assured. Nevertheless, substantial excess capacity coupled with weak finances make for great instability in most cases. Even if these companies are all able to weather the storm, it will not be at their current volumes of sales and employment.

Table 2
**Defense Dependency of the 25
 Major Contractors, 1989**

Rank	Company	Percent
75-100% OF SALES TO MILITARY		
6	Lockheed	91%
2	General Dynamics	87
8	Martin Marietta	75
50-74% OF SALES TO MILITARY		
10	Grumman	70
24	Avondale Industries	70
1	McDonnell Douglas	60
4	Raytheon	55
7	United Technologies	50
15	Litton Industries	50
25-49% OF SALES TO MILITARY		
17	TRW	40
20	Texas Instruments	33
12	Rockwell International	25
13	Westinghouse	25
22	Textron	25
25	FMC	25
0-24% OF SALES TO MILITARY		
9	Boeing	20
18	Unisys	20
23	Allied Signal	20
3	General Electric	16
21	Tenneco	15
14	Honeywell	13
11	GTE	10
19	ITT	8
16	IBM	5
5	General Motors	4

Source: Center for the Study of American Business, from various sources.

Major Defense Divisions of Civilian-Oriented Companies

A second set of major defense contractors looks to commercial markets for most of their business. Examples of large companies with important defense segments include Boeing, General Motors, Honeywell, Rockwell, Tenneco, Texas Instruments, Textron, and TRW.

These firms will benefit from the expansion of civilian markets, especially if macroeconomic policy succeeds in maintaining high levels of economic activity. Because their contracts with the Pentagon generally are less profitable than their commercial sales, some of these companies will respond to shrinking military markets by phasing down their defense business or trying to sell their defense segments. In one prior military cutback, AT&T's highly regarded Bell Laboratories left this market.

Smaller Contractors and Subcontractors

Less attention is usually given to the large array of small businesses, some of whom are prime contractors, but most of whom are subcontractors and suppliers to the large firms. Some of them will be badly hurt in the defense transition, especially as prime contractors pull business back into their own factories. However, many of the smaller firms are more capable of dual military and commercial work than the larger and often more muscle-bound prime contractors. In quite a few cases, they abandoned the military market during the 1980s in favor of less regulated and more profitable commercial work.⁹

Facing Common Problems

How should defense contractors react to the current and impending reductions in the military market? The politically popular alternative is to tell them to convert their operations to other pursuits; but that flies in the face of experience, especially for the larger firms. Seasoned defense industry executives show a more chastened and informed view.

Stanley Pace, recently retired chief executive of General Dynamics, says, "We've all come from smaller companies. We can all go back to being smaller companies."¹⁰ Similar

sentiments are voiced by Malcolm Currie, chairman of Hughes Aircraft, "The defense industry does not have to be at its present peak size to be a very healthy, profitable, vital industry."¹¹

A substantial downsizing is the most sensible response to the greatly reduced market for military equipment that seems likely in the 1990s. The sooner the major contractors reduce their excess capacity — through restructuring, mergers, sales of assets no longer needed, or simply closing down unneeded facilities — the greater will be their ability to withstand the competitive rigors of the new military marketplace.

This prescription is not as radical as it may seem at first. Many mergers have occurred in the defense industry over the years: McDonnell Aircraft acquired Douglas Aircraft, Electric Boat merged with Consolidated Aviation to form General Dynamics Corporation. Rockwell International is the result of consolidating North American Aviation and Rockwell Standard. Boeing acquired Vertol Aircraft. United Technologies combined United Aircraft and a variety of civilian companies such as Carrier and Otis Elevator.

On the other hand, the current market valuation of the shares of most of the defense firms is so low that substantial purchases of other companies would greatly dilute the holdings of existing shareholders. Moreover, few of these firms have large amounts of cash to risk on commercial diversification.

The shape of things to come may be seen by looking across the Atlantic. The consolidation of defense firms is a clear trend in Western Europe. In recent years, Germany's Daimler-Benz acquired Messerschmitt-Bolkow-Blohm. Britain's Plessey was taken over by a combination of Germany's Siemens and the United Kingdom's General Electric Company.

Responding to Changes in the Military Market

Over the next five years, the market for weapon systems is likely to decline by one-fourth or more.¹² As a result, the major U.S. defense firms will look significantly different by the mid-1990s than they do today. They will be down substantially from the peak size they attained in the 1980s and there may be fewer of them. But to the extent that they avoid wasteful

and fruitless "conversion" attempts and simply streamline their operations, they can achieve that new condition with few bankruptcies or hostile takeovers and with reasonable levels of profits and jobs.

Surely no great unmet commercial needs exist. To the extent that they do, they are being adequately met by commercial companies highly experienced in those markets. An indication of the future of the defense industry was Lockheed's painful decision in 1990 to close down all its aircraft production at Burbank, the city where it was founded. Honeywell spun off its torpedo and munitions business to its shareholders after trying unsuccessfully to sell it to other companies. Emerson Electric also spun off its defense divisions. Varian Associates dropped most of its defense operations to focus on more profitable lines of electronic equipment.

On the positive side, defense contractors can be expected to continue to search for new applications of their existing product lines, especially in markets close to the ones they now dominate. Grumman is working on a \$1 billion contract with the U.S. Postal Service to build approximately 100,000 delivery trucks. The Sikorsky Division of United Technologies produced over \$200 million of helicopters for the Coast Guard for intercepting drug smugglers. Lockheed sold two radar planes to the Customs Service for \$58 million. Boeing has sold some of its Vertol helicopters to oil companies to service offshore drilling platforms.

Also, Martin-Marietta won a \$900 million contract from the Federal Aviation Administration to help overhaul the nation's air-traffic-control system. The list goes on. But, in the aggregate, these close civilian applications of military products are a minor fraction of the military market. The \$1 billion being spent annually for drug interdiction equipment is dwarfed by the \$120 billion allocated each year to the development and acquisition of weapon systems. Moreover, it is too soon to say whether these new diversification efforts will be any more successful financially than the poor record of the past.

Two Different Approaches

Defense companies can choose between two different models of corporate behavior in responding to large cutbacks in the military budget. To simplify, let us call these the Boeing and the Grumman approaches.

When faced with a very large decline in the orders for its basic aerospace product line back in 1971, Boeing took the painful actions required to reduce the size of the company substantially. Over one-half of the entire work force was laid off. One was rented a billboard for a memorable message, "The last one out of Seattle, please turn off the lights."

Boeing's cutbacks were painful, extending to experienced engineers and craftsmen with considerable seniority. However, the downsizing left the company in a strong enough financial position to lead the next upturn in commercial aircraft sales and production. The result is a world-class corporation with a record backlog of orders.

Grumman, in contrast, followed the advice of those advocating "conversion" of the defense industry. It invested much of its resources in non-aerospace diversification efforts. The result has been unsuccessful, and has weakened Grumman's basic financial condition. Moreover, the job-creation objective that motivated the conversion approach was not achieved. In June 1990, the company offered early retirement to more than one-fifth of its entire work force.

Defense contractors are not eleemosynary institutions. To expect them to behave as charities is futile. Of course, the Boeing approach is initially painful, especially to the people laid off, their families, and their communities. But such changes are what separate a dynamic private-enterprise economy such as the United States has from the static, centrally planned societies which characterized Eastern Europe until very recently.

It is ironic that the strongest support for maintaining the current size of the defense companies by "converting" them to civilian markets comes from those who had been most vehemently attacking them for their "wasteful cost-plus" mode of operation.¹³ It is surprising that these critics do not welcome the rare opportunity to move resources out of those companies to what they consider to be more efficiency-minded, civilian-oriented enterprises.

Conclusion

In any event, the Persian Gulf crisis amply demonstrated that the United States still needs a powerful military establishment and a strong base of defense contractors — just not at the present size.

Change is an essential aspect of a modern competitive economy. In the 1980s, the tremendous expansion of the aerospace and other defense companies required attracting people and capital from other parts of the economy, often to the discomfort and displeasure of those other companies. Pleasant or not, we should not expect that type of movement always to be in one direction.

Putting the issues in perspective might benefit the defense companies and their employees. They could do worse than cite the compelling words of a long-term critic of high levels of military spending:

Even if Fidel Castro shaved off his beard and became a fellow of the American Heritage Foundation, we would still need the military-industrial complex for quite a while longer.¹⁴

Notes

1. See Denver Research Institute, *Defense Industry Diversification*, U.S. Arms Control and Disarmament Agency Publication 30 (Washington, D.C.: U.S. Government Printing Office, 1966); John E. Lynch, ed., *Economic Adjustment and Conversion of Defense Industries* (Boulder, Colo.: Westview Press, 1987).
2. Leo Reddy, *How U.S. Defense Industries View Diversification* (Washington, D.C.: Center for Strategic and International Studies, 1991), pp. 5-6.
3. Lloyd G. Dumas, "Making Peace Possible," in Suzanne Gordon and Dave McFadden, eds., *Economic Conversion* (Cambridge, Mass.: Ballinger Publishing, 1984), p. 69.
4. Battelle Memorial Institute, "Feasibility of Prompt Implementation of New Technologies by Civilian Industries to Offset Defense Contractor Cutbacks," in *Economic Adjustment/Conversion: Appendices* (Washington, D.C.: President's Economic Adjustment Committee, 1985), p. N-7.
5. Reddy, p. 27.
6. Norman R. Augustine, "The Real Dividend Is Peace," *World Link*, May-June 1990, p. 22.
7. U.S. Congressional Budget Office, *The Economic and Budget Outlook: Fiscal Years 1991-1995* (Washington, D.C.: U.S. Government Printing Office, 1990), p. 66.
8. David Evans, "Budget Pressure, End of Cold War Bringing Changes," *Chicago Tribune*, October 29, 1989, p. 1; "Sen. Nunn on Vision of Military," *The New York Times*, April 20, 1990, p. A10; Lawrence J. Korb, "How to Reduce Military Spending," *The New York Times*, November 21, 1989, p. 23.
9. James Blackwell, *Deterrence in Decay: The Future of the Defense Industrial Base* (Washington, D.C.: Center for Strategic and International Studies, 1989).
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11. Cited in Andy Pasztor and Rick Wartzman, "As Defense Industry Shrinks, Suppliers Face Widely Varying Fates," *The Wall Street Journal*, May 24, 1990, p. A8.
12. See, for example, *Summary of the Economic Effects of Reduced Defense Spending* (Washington, D.C.: U.S. Congressional Budget Office, 1990).
13. See Seymour Melman, *Pentagon Capitalism* (New York: McGraw-Hill, 1970).
14. George P. Brockway, "Don't Cash Your Peace Dividend," *The New Leader*, March 19, 1990, p. 15.